Use of Integral data to improve the European Activation File

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The European Activation File is the source of nuclear data for fusion activation calculations that has been developed in Europe. In order to trust the calculations made with the data, validation is essential. A key part of this is the comparison of the EAF data with integral experiments made in fusion relevant spectra on a wide range of materials. A review of the results for the EAF-2001 and -2003 libraries is given, leading on to the recent work on the test library EAF-2004. The latter is innovative in extending the upper energy range from 20 to 60 MeV. Although integral data above 20 MeV are scarce, recent measurements have meant that a start at these energies can be made. Examples of reactions that are considered to be validated are given, this requires that both the integral and differential data are consistent with the EAF data. Cases where integral data are good but differential data are lacking or discrepant are highlighted, as are cases where both types of experimental data differ from EAF.

The methodology for the use of measurements of the activity and heat to extract effective cross sections and the use of these to present C/E plots is detailed. This technique has the advantage that the integral data can be used during EAF library development rather than only when the library has been finalised. The improvement of the EAF cross section data in the various versions of the library is demonstrated.

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